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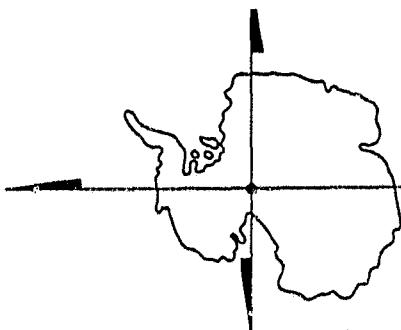
(NASA-TM-85385) ANTARCTIC METEORITE
NEWSLETTER, VOLUME 7, NUMBER 2: SAMPLE
REQUESTS AND ALLOCATIONS (NASA) 30 P
HC A03/MF A01 CSC1

N84-28714

CSCL 03B

Unclassified
13954

G3/91



Antarctic Meteorite NEWSLETTER

A periodical issued by the Antarctic Meteorite Working Group to inform scientists of the basic characteristics of specimens recovered in the Antarctic.

Volume 7 Number 2

July, 1984

Supported by the National Science Foundation, Division of Polar Programs, and compiled at Code SN2, Johnson Space Center, NASA, Houston, Texas 77058



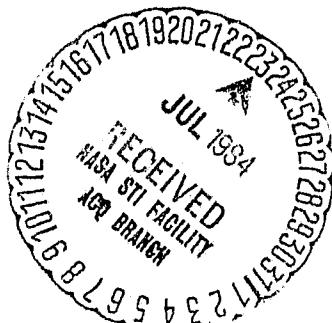
SAMPLE REQUESTS AND ALLOCATIONS

The Meteorite Working Group will meet in September for the purpose of reviewing requests for Antarctic Meteorites. Requests must be in by August 29, 1984.

Requests for specific samples (including sample name/number, weight requested, a brief description of the intended meteorite investigation, and pertinent sample specifics) should be sent to:

Secretary, MWG
Planetary Materials Branch, SN2
NASA, Johnson Space Center
Houston, Tx 77058 U.S.A.

Inside this newsletter are the recently classified meteorites that have not been previously announced. The less common types of meteorites have a data sheet in addition to the information available in Table 1.



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Partial List of Antarctic Meteorite Classifications by Year

Sample Number	Weight (g)	Classification	Weathering	FRACTURING	% Fa	% Fs
ALHA78003	124.8	L-6 Chondrite	C	B	24	20
ALHA78008	7.4	H-5 Chondrite			18	16
ALHA78012	30.1	H-5 Chondrite			18	16
ALHA78013	4.1	L-3 Chondrite			11-45	1-31
ALHA78021	17.1	H-5 Chondrite			18	16
ALHA78023	9.8	H-5 Chondrite			18	16
ALHA78028	4.4	H-5 Chondrite			18	16
ALHA78031	4.6	H-5 Chondrite			18	16
ALHA78035	2.5	H-6 Chondrite			18	16
ALHA78046	70.0	L-3 Chondrite			8-25	8-20
ALHA78051	119.5	H-4 Chondrite			18	15-18
ALHA78057	8.7	H-4 Chondrite			18	16
ALHA78062	10.9	LL-6 Chondrite			29	24
ALHA78067	7.8	H-6 Chondrite			18	16
ALHA78070	10.0	L-4 Chondrite			23	13-25
ALHA78079	4.5	H-5 Chondrite			18	16
ALHA78080	24.8	H-5 Chondrite			18	16
ALHA78101	121.2	L-6 Chondrite			24	21
ALHA78120	19.7	H-4 Chondrite			18	16
ALHA78122	4.7	H-6 Chondrite			19	17
ALHA78124	10.9	H-6 Chondrite			17	15
ALHA78133	59.9	L-3 Chondrite			1-34	1-16
ALHA78137	70.0	H-6 Chondrite			17	15
ALHA78141	7.7	H-5 Chondrite			18	16
ALHA78146	4.1	H-5 Chondrite			18	16
ALHA78150	4.6	H-5 Chondrite			18	16
ALHA78152	4.7	H-6 Chondrite			18	16
ALHA78156	8.6	L-6 Chondrite			24	21
ALHA78159	8.0	H-5 Chondrite			18	16
ALHA78164	7.1	H-5 Chondrite			18	16
ALHA78182	10.1	H-5 Chondrite			18	16
ALHA78184	8.2	H-6 Chondrite			18	16
ALHA78186	3.1	L-3 Chondrite			3-36	3-24
ALHA78189	7.6	H-6 Chondrite			18	16
ALHA78190	7.9	H-5 Chondrite			18	16
ALHA78191	6.9	H-6 Chondrite			18	16
ALHA78194	7.7	H-5 Chondrite			18	16
ALHA78197	8.1	H-5 Chondrite			18	16
ALHA78199	12.9	H-5 Chondrite			18	16
ALHA78201	9.8	H-5 Chondrite			18	16
ALHA78203	10.9	H-5 Chondrite			18	16
ALHA78205	8.9	H-5 Chondrite			18	16
ALHA78207	8.4	H-6 Chondrite			19	17
ALHA78236	14.4	L-3 Chondrite			2-37	3-26
ALHA78238	9.8	L-3 Chondrite			2-34	3-21
ALHA78241	6.5	H-5 Chondrite			18	16
ALHA78243	1.9	L-3 Chondrite			1-36	3-30
ALHA78245	4.0	H-5 Chondrite			18	16
ALHA78247	2.7	H-5 Chondrite			18	16
ALHA78249	4.2	H-6 Chondrite			18	16

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Sample Number	Weight (g)	Classification	Weathering	Fractionating	%Fa	%Fs
ALHA81180	16.6	H-6 Chondrite	C	B	18	16
ALHA81181	15.0	L-6 Chondrite	B	A	25	22
ALHA81182	4.6	H-5 Chondrite	B	A/B	18	16
ALHA81183	104.2	H-5 Chondrite	C	B/C	17	15
ALHA81184	16.7	L-4 Chondrite	A/B	A	24	20
ALHA81185	64.9	LL-6 Chondrite	A/B	A/B	30	25
ALHA81186	22.7	H-5 Chondrite	B	A/B	18	16
ALHA81187	40.0	Achon. (unclassified)	B/C	B	4	6.5
ALHA81188	8.7	H-5 Chondrite	A/B	A	19	17
ALHA81189	2.6	E-4 Chondrite	C	B	2	3
ALHA81190	48.3	L-3 Chondrite	C	A/B	0.3-32	4-28
ALHA81191	30.4	L-3 Chondrite	C	B/C	2-29	1-30
ALHA81192	8.9	H-5 Chondrite	A/B	A	19	16
ALHA81193	13.3	H-6 Chondrite	B	A	18	16
ALHA81194	17.0	H-5 Chondrite	B	B	19	16
ALHA81195	4.9	H-5 Chondrite	B	A/B	18	16
ALHA81196	9.4	H-6 Chondrite	B	A	18	16
ALHA81197	67.7	H-5 Chondrite	B/C	B/C	17	15
ALHA81198	0.8	L-5 Chondrite	B/C	A	24	21
ALHA81199	16.0	H-4 Chondrite	C	B	19	16
ALHA81200	9.4	H-4 Chondrite	B/C	A	19	17
ALHA81201	6.5	H-5 Chondrite	B/C	A	18	16
ALHA81202	5.4	H-5 Chondrite	C	A	19	17
ALHA81203	3.8	L-6 Chondrite	C	A	25	21
ALHA81204	7.3	H-6 Chondrite	B	A	18	16
ALHA81205	2.8	L-6 Chondrite	B	A	25	23
ALHA81206	3.8	H-4 Chondrite	B/C	A	18	15-21
ALHA81207	14.1	H-5 Chondrite	C	B	18	16
ALHA81208	1.6	Diogenite/Mesosiderite	C	B		25
ALHA81209	13.9	H-5 Chondrite	B/C	A	18	16
ALHA81213	2.9	H-5 Chondrite	B/C	A	19	17
ALHA81214	4.3	L-3 Chondrite	B/C	A	0.2-38	0,1-45
ALHA81215	11.2	H-5 Chondrite	A	A	18	16
ALHA81217	5.4	L-6 Chondrite	C	B/C	24	20
ALHA81218	5.5	H-5 Chondrite	C	B	19	16
ALH 82102	48.0	H-5 Chondrite (in ice)	B/C	A	18	16
ALH 82106	35.1	Ureilite	B	A	3	4
ALH 82107	9.2	L-5 Chondrite	B/C	A	22	19
ALH 82108	13.5	H-5 Chondrite	B/C	A	18	16
ALH 82109	47.2	H-5 Chondrite	B/C	A/B	18	16
ALH 82110	39.3	H-3 Chondrite	B/C	B	1-24	4-27
ALH 82111	63.0	L-6 Chondrite	A/B	A	24	21
ALH 82112	28.3	H-5 Chondrite	C	A	17	16
ALH 82113	61.1	H-6 Chondrite	A/B	A	18	16
ALH 82114	40.7	H-5 Chondrite	A/B	A	17	15
ALH 82115	48.5	H-5 Chondrite	A/B	A	18	16
ALH 82116	18.4	H-6 Chondrite	B	B	18	16
ALH 82117	4.2	L-5 Chondrite	B	B	25	22
ALH 82118	110.9	L-6 Chondrite	A/B	B	24	20
ALH 82119	23.9	H-5 Chondrite	B/C	B	18	16
ALH 82120	7.2	H-5 Chondrite	B	A	19	17
ALH 82121	2.4	L-6 Chondrite	A	B	24	20
ALH 82122	142.0	H-5 Chondrite	B	A	18	16

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Sample Number	Weight (g)	Classification	Weathering	Fracturing	%Fa	%Fs
ALH 82123	110.8	L-6 Chondrite	B	A	25	20
ALH 82124	25.8	H-6 Chondrite	C	A/B	18	16
ALH 82125	178.4	L-6 Chondrite	C	B	24	20
ALH 82126	139.9	H-4 Chondrite	B/C	A	18	15
ALH 82127	5.1	H-6 Chondrite	A/B	A	18	16
ALH 82128	15.1	H-4 Chondrite	B/C	A	18	16
ALH 82129	14.1	H-5 Chondrite	B/C	A	18	17
ALH 82130	44.6	Ureilite	B	A	3	4
ALH 82131	1.0	Carbonaceous C2	A	B	0.3	
ALH 82132	5.9	E-4 Chondrite	C	B/C		0.4
ALH 82133	19.6	H-4 Chondrite	B/C	A/B	18	16
ALH 82134	28.2	H-5 Chondrite	B/C	A	16	15
ALH 82135	12.1	Carbonaceous C4	A	A	27	24
ALH 82136	4.3	H-4 Chondrite	B	B	18	5-20
ALH 82137	10.8	L-5 Chondrite	B	A	23	20
ALH 82138	5.0	H-6 Chondrite	B	A/B	19	17
ALH 82139	0.2	L-6 Chondrite	B	A	24	20
ALH 82140	0.2	L-6 Chondrite	C	A	25	20
ALH 82141	0.6	H-5 Chondrite	C	A	19	17
ALH 82142	20.0	L-6 Chondrite	C	B/C	25	21
ALH 82143	3.5	H-6 Chondrite	C	A/B	18	16
ALH 82144	7.3	H-5 Chondrite	B	A	19	17
EET 82601	149.5	L-3 Chondrite	B/C	A	2-39	1-35
EET 82608	94.5	LL-6 Chondrite	A/B	A	28	23
EET 82610	42.1	H-6 Chondrite	B	A	19	17
EET 82611	12.6	L-4 Chondrite	B	B	24	21
EET 82612	31.6	L-6 Chondrite	A	A	25	21
EET 82613	4.2	L-4 Chondrite	B	A	24	20
EET 82614	8.4	H-5 Chondrite	A/B	A	18	16
EET 82615	29.3	H-6 Chondrite	B	A	19	17
EET 82616	2.1	H-4 Chondrite	B/C	A	18	16
PCA 82500	90.9	Carbonaceous C4V	B	C	31	
PCA 82511	150.0	H-4 Chondrite	B	B	17	14
PCA 82512	49.9	H-6 Chondrite	B	A	18	16
PCA 82514	129.8	L-4 Chondrite	B	A	23	11-22
PCA 82515	6.9	H-4 Chondrite	B	A/B	17	14
PCA 82516	16.0	H-6 Chondrite	B/C	B	18	16
PCA 82517	41.3	H-5 Chondrite	B/C	B	19	17
PCA 82518	21.9	E-4 Chondrite	B	A	0.8	
PCA 82519	125.0	L-5 Chondrite	B	A	24	21
PCA 82520	22.7	H-3 Chondrite	B/C	A/B	15-22	2-19
PCA 82521	1.4	H-5 Chondrite	C	A	18	16
PCA 82522	45.5	H-5 Chondrite	B/C	B	18	16
PCA 82523	11.5	H-6 Chondrite	A	B	19	16
PCA 82524	113.8	H-4 Chondrite	A/B	B	18	16
PCA 82525	40.2	L-6 Chondrite	B	B	24	20
PCA 82526	24.9	H-6 Chondrite	B	A	18	16
PCA 82527	3.4	H-6 Chondrite	A	A	18	16
PCA 82528	51.4	L-6 Chondrite	B/C	B	25	21
TIL 82406	152.0	L-4 Chondrite	B	A	23	19
TIL 82408	80.0	LL-3 Chondrite	B	A/B	1-29	2-21

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Sample Number	Weight (g)	Classification	Weathering	Fractionating	%Fa	%Fs
TIL 82410	18.8	Diogenite	A	B		24
TIL 82412	35.1	H-5 Chondrite	C	B	17	16
TIL 82413	18.3	H-5 Chondrite	C	B	17	16
TIL 82414	14.2	H-5 Chondrite	B	A	17	15
TIL 82415	70.2	H-5 Chondrite	A/B	A	17	15
EET 83230	530.0	Iron-Ataxite				
EET 83245	59.0	Iron-Octahedrite				
ILD 83500	2523.0	Iron-Ataxite				

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Achondrites

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
ALHA81187	40.0	Achon. (unclassified)	B/C	B	4	6.5
TIL 82410	18.8	Diogenite	A	B		24
ALHA81208	1.6	Diogenite/Mesosiderite	C	B		25
ALH 82106	35.1	Ureilite	B	A	3	4
ALH 82130	44.6	Ureilite	B	A	3	4

Carbonaceous Chondrites

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
ALH 82131	1.0	Carbonaceous C2	A	B	0.3	
ALH 82135	12.1	Carbonaceous C4	A	A	27	24
PCA 82500	90.9	Carbonaceous C4V	B	C	31	

Chondrites - Type 3

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
ALH 82110	39.3	H-3 Chondrite	B/C	B	1-24	4-27
PCA 82520	22.7	H-3 Chondrite	B/C	A/B	15-22	2-19
ALHA78013	4.1	L-3 Chondrite			11-45	1-31
ALHA78046	70.0	L-3 Chondrite			8-25	8-20
ALHA78133	59.9	L-3 Chondrite			1-34	1-16
ALHA78186	3.1	L-3 Chondrite			3-36	3-24
ALHA78236	14.4	L-3 Chondrite			2-37	3-26
ALHA78238	9.8	L-3 Chondrite			2-34	3-21
ALHA78243	1.9	L-3 Chondrite			1-36	3-30
ALHA81190	48.3	L-3 Chondrite	C	A/B	0.3-32	4-28
ALHA81191	30.4	L-3 Chondrite	C	B/C	2-29	1-30
ALHA81214	4.3	L-3 Chondrite	B/C	A	0.2-38	0.1-45
EET 82601	149.5	L-3 Chondrite	B/C	A	2-39	1-35
TIL 82408	80.0	LL-3 Chondrite	B	A/B	1-29	2-21

Chondrites - Type 4

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Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
ALHA81189	2.6	E-4 Chondrite	C	B	2	3
ALH 82132	5.9	E-4 Chondrite	C	B/C		0.4
PCA 82518	21.9	E-4 Chondrite	B	A	0.8	
ALHA78051	119.5	H-4 Chondrite			18	15-18
ALHA78057	8.7	H-4 Chondrite			18	16
ALHA78120	19.7	H-4 Chondrite			18	16
ALHA81199	16.0	H-4 Chondrite	C	B	19	16
ALHA81200	9.4	H-4 Chondrite	B/C	A	19	17
ALHA81206	3.8	H-4 Chondrite	B/C	A	18	15-21
ALH 82126	139.9	H-4 Chondrite	B/C	A	18	15
ALH 82128	15.1	H-4 Chondrite	B/C	A	18	16
ALH 82133	19.6	H-4 Chondrite	B/C	A/B	18	16
ALH 82136	4.3	H-4 Chondrite	B	B	18	5-20
EET 82616	2.1	H-4 Chondrite	B/C	A	18	16
PCA 82511	150.0	H-4 Chondrite	B	B	17	14
PCA 82515	6.9	H-4 Chondrite	B	A/B	17	14
PCA 82524	113.8	H-4 Chondrite	A/B	B	18	16
ALHA78070	10.0	L-4 Chondrite			23	13-25
ALHA81184	16.7	L-4 Chondrite	A/B	A	24	20
EET 82611	12.6	L-4 Chondrite	B	B	24	21
EET 82613	4.2	L-4 Chondrite	B	A	24	20
PCA 82514	129.8	L-4 Chondrite	B	A	23	11-22
TIL 82406	152.0	L-4 Chondrite	B	A	23	19

Irons

Sample Number ..	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
EET 83230	530.0	Iron-Ataxite				
ILD 83500	2523.0	Iron-Ataxite				
EET 83245	59.0	Iron-Octahedrite				

July 1984

List of the Newly Announced Meteorites that are Paired

It has been known for some time that many of the Antarctic meteorite fragments are pieces from common falls. The list that follows contains those that are believed at the present time to be paired with some degree of certainty. Criteria used to determine this are:

- t Field relations
- v Physical similarities (external morphology)
- w Petrographic and microprobe similarities
- x Metallography
- y Bulk chemistry
- z Trace element chemistry

Achondrites

Ureilites

- 1) ALHA 82106, 82130. w

Chondrites

H5 Chondrites

- 2) TIL 82412, 82413. w
3) TIL 82414, 82415. w

H6 Chondrites

- 3) EET 82610, 82615. w

L3 Chondrites

- 4) ALHA77011, 78013, 78186, 78236, 78238,
78243, 81190, 81191, 81214. w

Sample No.: ALHA81187 Location: Allan Hills
Field No.: 1236
Weight (gms): 40.0
Meteorite Type: Achondrite (unclassified)/Forsterite Chondrite

Physical Description: Roberta Score

Fusion crust covers two surfaces, one of which contains remnants of flow features. Several cracks penetrate the mostly weathered interior of the stone.

Dimensions: 4.5 x 2.5 x 2 cm

Petrographic Description: Brian Mason

The section shows an aggregate of anhedral to subhedral grains, 0.05-0.6 mm across, of pyroxene and olivine, with about 20% of disseminated nickel-iron and minor amounts of plagioclase, troilite, and schreibersite. The proportion of pyroxene to olivine is estimated at 4:1. Weathering is extensive, with veinlets and small areas of brown limonite throughout the section. Microprobe analyses give the following compositions: olivine, Fa4; pyroxene, Wo₃Fs6.5; plagioclase, An18. The meteorite is tentatively considered to be an achondrite (unclassified), but it may belong to the small group of forsterite chondrites (Graham et al., Mineralogical Magazine, v. 41, p. 201, 1977).

Sample No.: ALHA81208 Location: Allan Hills
Field No.: 1663
Weight (gms): 1.6
Meteorite Type: Diogenite/Mesosiderite

Physical Description: Roberta Score

Evaporite deposit coats the oxidized fusion crust that completely covers this meteorite. The interior is extensively weathered and the stone crumbled when it was chipped.

Dimensions: 2.5 x 1 x 0.5 cm

Petrographic Description: Brian Mason

The thin section consists almost entirely of orthopyroxene clasts, ranging up to 3 mm in maximum dimension. Accessory chromite is present. The individual clasts are rimmed by dark brown to black material, which consists in part of limonite. Remnants of fusion crust are present, and have an outer crust of brown limonite. Microprobe analyses show that the pyroxene is essentially uniform in composition, except for some variation in calcium content (CaO 1.2-2.5%); mean composition is Wo₃Fs25 (Al₂O₃ 0.7%, TiO₂ 0.14%, MnO 0.6%). The meteorite is classified as a diogenite, although the amount of limonite suggests that it may be a silicate fragment from a mesosiderite.

Sample No.: ALHA81189
Field No.: 1582
Weight (gms): 2.6
Meteorite Type: E4 Chondrite

Location: Allan Hills

Physical Description: Roberta Score

No fusion crust remains on this fractured reddish brown colored stone.

Dimensions: 2 x 1.5 x 0.5 cm

Petrographic Description: Brian Mason

The section shows an aggregate of chondrules, chondrule fragments, and mineral grains set in an opaque matrix. The chondrules range up to 0.9 mm in diameter; most of them consist of granular pyroxene (sometimes with a little olivine), but a few are made up of nickel-iron and troilite. The matrix consists largely of nickel-iron and troilite, with a considerable amount of limonite formed by weathering of the metal. Microprobe analyses show that the pyroxene is close to $MgSiO_3$ in composition (FeO 0.5-4.5, mean 1.9%; Al₂O₃ 0.02-2.4, mean 0.7%; CaO 0.1-0.7, mean 0.3%; TiO₂ 0-0.13, mean 0.08%; MnO 0.07-0.22, mean 0.15%). Most of the olivine grains are close to Mg_2SiO_4 in composition (FeO 0.7-6.4%). One grain of a silica polymorph was analyzed. Since part of the pyroxene is polysynthetically twinned clinostatite, the meteorite is tentatively classified as an E4 chondrite; however, it shows some similarities to Kakangari, classified by Graham et al. (Mineralogical Magazine, V.41, p. 201, 1977) as a forsterite chondrite.

Sample No.: ALH82102
Field No.: 2995
Weight (gms): 48.0
Meteorite Type: H5 Chondrite

Location: Allan Hills

Physical Description: Roberta Score

The stone was found apparently weathering out of the ice at the Far Western Ice Field. This specimen was collected *in situ* in a large block of encasing ice. The ice block was sent to an ice coring lab in New Hampshire and was determined to be original (not refrozen) ice. Extreme care was taken to preserve the orientation of both the ice and meteorite. Allocations of both are available.

The dull, black polygonally fractured fusion crust contains many centimeter-sized, highly oxidized halos that are orangish-red in color. One fracture surface contains a small amount of fusion crust but is generally a reddish-brown color.

The interior of this meteorite is evenly weathered with only a small area of unweathered material remaining. A couple of minor fractures are present.

Dimensions: 3 x 4 x 4 cm

Petrographic Description: Brian Mason

Chondrules are fairly abundant, ranging up to 2 mm in diameter; they are set in a groundmass of fine-grained olivine and pyroxene with minor amounts of coarser-grained nickel-iron and troilite. Some weathering is indicated by brown limonitic staining, concentrated around metal grains. Microprobe analyses give the following compositions: olivine, Fa18; pyroxene, Fs16. The meteorite is an II5 chondrite.

Sample No.: ALH82106 & ALH82130

Location: Allan Hills

Field No.: 2914 & 2994

Weight (gms): 35.1 & 44.6

Meteorite Type: Ureilite

Physical Description: Roberta Score

Patches of black fusion crust and remnant fusion crust cover much of these fragments. The interior surfaces are nearly black in color with moderate to heavy oxidation present. Well developed crystal faces are obvious. Samples appear to have been shocked.

Dimensions: 4.5 x 2.5 x 2.5

Petrographic Description: Brian Mason

The section shows an aggregate of anhedral to subhedral grains (0.3-1.8 mm across) of olivine (about 60%) and pyroxene (about 30%), with about 10% of opaque material, in part disseminated throughout and in part concentrated along grain boundaries. Both olivine and pyroxene show undulose extinction; olivine grains are gray from submicroscopic opaque inclusions, whereas pyroxene grains are clear but are extremely fractured. The opaque material along grain boundaries consists of graphite and secondary iron oxides. Microprobe analyses give the following compositions: olivine, somewhat variable, Fa0-Fa5, mean Fa3; pyroxene, essentially uniform, Wo5Fs4En91; a grain of endiopside, Wo36Fs2En62, was analysed. The mineralogy and texture are typical of a ureilite, but the minerals in this meteorite have a higher Mg/Fe ratio than any ureilite so far described.

ALH82130 is essentially identical to ALH82106 in all respects and can confidently be paired with it.

Sample No.: ALH82131
Field No.: 2913
Weight (gms): 1.0
Meteorite Type: C2 Chondrite

Location: Allan Hills

Physical Description: Roberta Score

One small patch of blistery fusion crust remains on this small meteorite fragment. The color of the exterior surfaces is black with a greenish tinge. The interior matrix is black and contains many submillimeter sized white inclusions. A green colored weathering rind extends approximately 1 mm into the interior of the stone.

Dimensions: 1 x 1 x 0.5 cm

Petrographic Description: Brian Mason

The very small section shows a single chondrule in black opaque matrix. Microprobe analyses show that the matrix has the composition characteristic of C2 chondrites. Olivine in the chondrule is almost pure forsterite (FeO, 0.3%; CaO, 0.3-0.4%). The meteorite is a C2 chondrite.

Sample No.: ALH82132
Field No.: 2983
Weight (gms): 5.9
Meteorite Type: E4 Chondrite

Location: Allan Hills

Physical Description: Roberta Score

Some fusion crust remains on this otherwise iridescent reddish-brown, highly oxidized stone. Thin evaporite deposit coats some of the extensively weathered interior surfaces.

Dimensions: 2 x 2 x 1 cm

Petrographic Description: Brian Mason

Chondrules are relatively abundant, but are small, ranging up to 0.6 mm in diameter; most of them consist of pyroxene, but some are made up entirely or almost entirely of nickel-iron and troilite. The matrix consists largely of granular pyroxene, with lesser amounts of nickel-iron and sulfides, and a little plagioclase and a silica polymorph. The meteorite is considerably weathered, with brown limonitic staining throughout the section. Microprobe analyses show that the pyroxene is almost pure MgSiO₃ (FeO 0.06-0.7, mean 0.3%; Al₂O₃ 0-0.3, mean 0.04%; CaO 0.02-0.6, mean 0.16%; TiO₂, MnO, less than 0.05%). Plagioclase is almost pure albite (CaO 0.02%, K₂O 0.11%). The meteorite is an enstatite chondrite, and since part of the pyroxene is polysynthetically twinned clinoenstatite, it is classified as an E4 chondrite.

Sample No.: ALH82135
Field No.: 2973
Weight (gms): 12.1
Meteorite Type: C4 Chondrite

Location: Allan Hills

Physical Description: Roberta Score

Black fusion crust covers most of this triangular shaped stone. When ALH82135 was broken, a massive, dark bluish-gray colored matrix was exposed. Some oxidation is present.

Dimensions: 3 x 2.5 x 1 cm

Petrographic Description: Brian Mason

The section consists largely of finely granular olivine (grains ranging up to 0.1 mm), with a little pyroxene, plagioclase, and opaques (largely magnetite). A few chondrules, made up of coarser-grained olivine, are present. Microprobe analyses give the following compositions: olivine, Fa27 (a few grains have higher Fa values); pyroxene, Fs25; plagioclase, An53. This meteorite is similar to Karoonda and PCA82500 in texture and mineral compositions and is tentatively classified as a C4 chondrite.

Sample No.: EET82601
Field No.: 2963
Weight (gms): 149.5
Meteorite Type: L3 Chondrite

Location: Elephant Moraine

Physical Description: Carol Schwarz

This angular to subrounded specimen is covered with patchy and remnant fusion crust. Chondrules 1-4 mm are visible on the surface. The interior is very dark with 1 mm weathered chondrules visible.

Dimensions: 5.5 x 5 x 3 cm

Petrographic Description: Brian Mason

The section shows a close-packed aggregate of chondrules, ranging up to 1.5 mm in maximum dimension; a variety of types is present, the commonest being granular and porphyritic olivine and olivine-pyroxene, and cryptocrystalline pyroxene. The small amount of matrix is fine-grained and opaque, and contains a few grains of nickel-iron and troilite. The meteorite is considerably weathered, with brown limonitic staining throughout the section. Olivine and pyroxene have variable composition. Olivine composition ranges from Fa2 to Fa39 with a mean of Fa22 (% mean deviation of FeO is 36). Pyroxene composition ranges from Fs1 to Fs35, with a mean of Fs13 (% mean deviation of FeO is 45). The texture and variable mineral compositions are those of type 3, and the amount of metal suggests L group, hence the meteorite is tentatively classified L3.

Sample No.: EET82608

Location: Elephant Moraine

Field No.: 2988

Weight (gms): 94.5

Meteorite Type: LL6 Chondrite

Physical Description: Carol Schwarz

The specimen is covered with a dull black fusion crust. The interior is light gray with some darker gray areas. There is a small amount of yellowish weathering present.

Dimensions: 5 x 4 x 2.5 cm

Petrographic Description: Brian Mason

Chondrules are sparse and poorly defined, their margins tending to merge with the granular groundmass, which consists largely of olivine and pyroxene, with minor amounts of plagioclase, sulfide, and nickel-iron. A minor degree of weathering is indicated by brown limonitic staining around metal grains. Well-preserved fusion crust rims part of the section. Microprobe analyses give the following compositions: olivine, Fa28; pyroxene, Fs23; plagioclase, An10; merrillite and diopside (Wo44En47Fs9) were also identified. The meteorite is an LL6 chondrite.

Sample No.: EET82610

Location: Elephant Moraine

Field No.: 2962

Weight (gms): 42.1

Meteorite Type: H6 Chondrite

Physical Description: Carol Schwarz

Patchy fusion crust occurs on three sides of this specimen. The other sides are brownish in color with no distinguishing features. The interior is dark and fine grained with no features visible.

Dimensions: 4 x 3 x 2 cm

Petrographic Description: Brian Mason

Chondritic structure is barely discernible, the sparse chondrules merging with the granular groundmass, which consists largely of olivine and pyroxene, with minor amounts of nickel-iron, troilite, and plagioclase. Extensive weathering is indicated by veinlets and small areas of red-brown limonite throughout the section. Microprobe analyses give the following compositions: olivine, Fa19; pyroxene, Fs17; plagioclase, An12. The meteorite is an H6 chondrite.

EET82615 is essentially identical to EET82610 in texture, mineral compositions, and degree of weathering. The possibility of paring should be considered.

Sample No.: EET82611
Field No.: 2987
Weight (gms): 12.6
Meteorite Type: L4 Chondrite

Location: Elephant Moraine

Physical Description: Carol Schwarz

Dull black fusion crust with oxidation halos covers this specimen. Several fractures occur on the fusion crust. The interior is reddish brown to yellowish from weathering.

Dimensions: 3.5 x 2 x 1.5 cm

Petrographic Description: Brian Mason

Chondritic structure is well-developed, with chondrules ranging up to 2.7 mm in maximum dimension; a variety of types is present, including barred olivine, porphyritic and granular olivine and olivine-pyroxene, and fine-grained pyroxene. The groundmass consists of fine-grained olivine and pyroxene with larger grains of nickel-iron and troilite. Considerable weathering is indicated by brown limonitic staining throughout the section. Microprobe analyses give the following compositions: olivine, Fa24, pyroxene, Fs21. The meteorite is an L4 chondrite.

Sample No.: EET82612
Field No.: 2931
Weight (gms): 31.6
Meteorite Type: L6 Chondrite

Location: Elephant Moraine

Physical Description: Carol Schwarz

This surrounded smooth specimen is covered with dull, black, polygonally fractured fusion crust. The interior is light gray with a little yellowish oxidation staining.

Dimensions: 2 x 2.5 x 2 cm

Petrographic Description: Brian Mason

Chondrules are sparse and poorly defined, their margins merging with the granular groundmass, which consists largely of olivine and pyroxene, with minor amounts of plagioclase, troilite and nickel-iron. The section is traversed by dark veinlets, up to 0.2 mm thick, probably the result of shock. A minor degree of weathering is indicated by brown limonitic staining around metal grains. Microprobe analyses give the following compositions: olivine, Fa25; pyroxene, Fs21; plagioclase, An10. The meteorite is an L6 chondrite.

Sample No.: EET82613
Field No.: 2977
Weight (gms): 4.2
Meteorite Type: L4 Chondrite

Location: Elephant Moraine

Physical Description: Carol Schwarz

This angular fragment is shaped like the corner of a larger piece. The interior is yellowish with some less weathered gray matrix visible. The fusion crust is black and dull and approximately 1 mm thick.

Dimensions: 1.5 x 1.5 x 1.5 cm

Petrographic Description: Brian Mason

Chondrules are abundant and well-developed, ranging up to 1.5 mm in diameter; a variety of types are present, the commonest being granular and porphyritic olivine and olivine-pyroxene (much of the pyroxene is polsynthetically twinned clinobronzite). The chondrules are set in a groundmass consisting largely of fine-grained olivine and pyroxene, with minor amounts of coarser-grained nickel-iron and troilite. A moderate degree of weathering is indicated by brown limonitic staining concentrated around metal grains. Microprobe analyses give the following compositions: olivine, Fa24; pyroxene, Fs20. The meteorite is an L4 chondrite.

Sample No.: EET82614
Field No.: 2959
Weight (gms): 8.4
Meteorite Type: H5 Chondrite

Location: Elephant Moraine

Physical Description: Carol Schwarz

Black to iridescent fusion crust covers this meteorite fragment. The interior is gray with small lighter gray chondrules.

Dimensions: 2 x 2 x 1.5 cm

Petrographic Description: Brian Mason

Chondrules are sparse and poorly defined, tending to merge with the granular groundmass, which consists largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite. The groundmass olivine and pyroxene have a comminuted appearance, suggestive of a shock event. Brown limonitic staining is present around metal grains. Microprobe analyses give the following compositions: olivine, Fa18; pyroxene, Fs16. The meteorite is an H5 chondrite.

Sample No.: EET82616
Field No.: 2984
Weight (gms): 2.1
Meteorite Type: H4 Chondrite

Location: Elephant Moraine

Physical Description: Carol Schwarz

This tiny meteorite is covered with black to iridescent brown fusion crust.

Dimensions: 1.4 x 1 x 0.6 cm

Petrographic Description: Brian Mason

Chondrules are numerous and well-developed, ranging up to 1.5 mm in diameter; a variety of types is present, including barred olivine, granular and porphyritic olivine and olivine-pyroxene (the pyroxene being polysynthetically twinned clinobronzite), and fine-grained to cryptocrystalline pyroxene. The groundmass consists largely of fine-grained olivine and pyroxene, with minor amounts of coarser-grained nickel-iron and troilite. Brown limonitic staining pervades the section. Microprobe analyses give the following compositions: olivine, Fa18; pyroxene, Fs16. The meteorite is an H4 chondrite.

Sample No.: PCA82511
Field No.: 2760
Weight (gms): 150.0
Meteorite Type: H4 Chondrite

Location: Pecora Escarpment

Physical Description: Roberta Score

Flow marks are apparent in the iridescent brown to black fusion crust on the top surface. The bottom surface contains several fractures and the fusion crust is badly weathered, having an orangish tinge. The interior that was exposed by chipping may not be representative of the entire stone. Weathering is heavy with only small pockets of unweathered light gray material present.

Dimensions: 5.5 x 6 x 3.5 cm

Petrographic Description: Brian Mason

Chondrules are abundant and well-developed; a variety of types is present, the commonest being porphyritic olivine and olivine-pyroxene, and radiating pyroxene. Much of the pyroxene is polysynthetically twinned clinobronzite. The matrix consists of fine-grained olivine and pyroxene, with minor amounts of nickel-iron and troilite; it is heavily stained with limonite. Well-preserved fusion crust is present along one edge. Microprobe analyses give the following compositions: olivine, Fa17; pyroxene, Fs15. The meteorite is an H4 chondrite.

Sample No.: PCA82512
Field No.: 2747
Weight (gms): 49.9
Meteorite Type: H6 Chondrite

Location: Pecora Escarpment

Physical Description: Roberta Score

Dull brownish-black fusion crust has been plucked off some faces of this rounded stone. Fusion crust does not exist on all faces. The exterior has a greenish-brown color and many inclusions are visible.

Abundant minute metal flecks and large patches of deep reddish-brown oxidation are present in the otherwise dark brownish gray matrix. Dark colored inclusions are obvious as are a few, small well-developed crystal faces.

Dimensions: 4 x 3 x 2.5 cm

Petrographic Description: Brian Mason

Chondrules are sparse and poorly defined, tending to merge with the granular groundmass, which consists largely of olivine and pyroxene, with minor amounts of nickel-iron, troilite, and plagioclase. A moderate degree of weathering is indicated by small amounts of brown limonite scattered throughout the section. Microprobe analyses give the following compositions: olivine, Fa18; pyroxene, Fs16; plagioclase, An12. The meteorite is an H6 chondrite.

Sample No.: PCA82514
Field No.: 2714
Weight (gms): 129.8
Meteorite Type: L4 Chondrite

Location: Pecora Escarpment

Physical Description: Roberta Score

Dull black fusion crust is present on one surface. The other surfaces are reddish-brown. The interior is a medium gray color with darker and lighter colored inclusions present. A partial weathering rind was exposed when the stone was chipped.

Dimensions: 6 x 3 x 3 cm

Petrographic Description: Brian Mason

Chondrules are abundant and well-developed, ranging up to 2 mm in diameter; a variety of types is present, including porphyritic olivine and olivine-pyroxene, barred olivine, and fine-grained pyroxene. Much of the pyroxene is polysynthetically twinned clinobronzite. The matrix consists of fine-grained olivine and pyroxene, with coarser grains of nickel-iron and troilite. Brown limonitic staining surrounds the metal grains. Microprobe analyses give the following compositions: olivine, Fa23; pyroxene somewhat variable, Fs11-Fs22, mean Fs18. The meteorite is an L4 chondrite.

Sample No.: PCA82515 Location: Pecora Escarpment
Field No.: 2732
Weight (gms): 6.9
Meteorite Type: H4 Chondrite

Physical Description: Roberta Score

Fusion crust covers one surface of this reddish-brown colored stone. The dark gray matrix is inclusion rich. Metal is abundant.

Dimensions: 2 x 2 x 1 cm

Petrographic Description: Brian Mason

Chondrules are abundant, but some are irregular in shape; the commonest types are porphyritic and granular olivine and olivine-pyroxene. Much of the pyroxene is polysynthetically twinned clinobronzite. The matrix consists largely of fine-grained olivine and pyroxene, with minor amounts of coarser-grained nickel-iron and troilite. Brown limonitic staining pervades the section. Microprobe analyses give the following compositions: olivine, Fa17; pyroxene somewhat variable, mean Fs14. The meteorite is an H4 chondrite.

Sample No.: PCA82516 Location: Pecora Escarpment
Field No.: 2740
Weight (gms): 16.0
Meteorite Type: H6 Chondrite

Physical Description: Roberta Score

This meteorite fragment has black blistery fusion crust covering 60% of the exterior surface. The remaining 40% is iridescent reddish-brown. The interior is extensively weathered though a few inclusions and some metal are obvious.

Dimensions: 2.5 x 2.5 x. 1.5 cm

Petrographic Description: Brian Mason

Chondrules are rare and barely discernible from the granular groundmass, which consists largely of olivine and pyroxene with minor amounts of plagioclase, nickel-iron, and troilite. Well-preserved fusion crust rims part of the section. Limonitic staining and veinlets of red-brown limonite are present throughout the section. Microprobe analyses give the following compositions: olivine, Fa18; pyroxene, Fs16; plagioclase, An12. The meteorite is an H6 chondrite.

Sample No.: PCA82517
Field No.: 2784
Weight (gms): 41.3
Meteorite Type: H5 Chondrite

Location: Pecora Escarpment

Physical Description: Roberta Score

Weathered dull black to brown fusion crust coats the entire well-rounded stone. Fusion crust ranges in thickness from 1 mm to 5 mm. Several fractures penetrate the interior of the stone. Small areas of the interior are dark gray to black in color though most of the interior is extensively weathered. Few metal flecks are present.

An ice sample (approximately 40 kg) was taken by the field team at this meteorite location site in Pecora Escarpment and is available for allocation.

Dimensions: 4 x 3 x 2 cm

Petrographic Description: Brian Mason

Chondrules are moderately abundant, and are set in a granular groundmass which consists largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite. The meteorite is considerably weathered, with brown limonitic staining throughout the section. Microprobe analyses give the following compositions: olivine, Fa19; pyroxene, Fs17. The meteorite is an H5 chondrite.

Sample No.: PCA82518
Field No.: 2782
Weight (gms): 21.9
Meteorite Type: E4 Chondrite

Location: Pecora Escarpment

Physical Description: Roberta Score

The fusion crust covering PCA82518 is shiny, iridescent, and ranges in color from orangish-red to brown to black. The exterior is dotted with numerous vugs that are lined with fusion crust. Dark brown matrix with abundant chondrules (as large as 3 mm in diameter) and metal make up the interior surfaces.

Dimensions: 3 x 2.5 x 2 cm

Petrographic Description: Brian Mason

Chondrules are abundant, but are small, ranging from 0.3 to 0.9 mm in diameter; they consist of granular or fine-grained pyroxene. The matrix consists largely of granular pyroxene, with lesser amounts of nickel-iron and sulfides, and a little plagioclase. The meteorite is considerably weathered, with brown limonitic staining throughout the section. Microprobe analyses show that the pyroxene is almost pure MgSO₃ (FeO 0.2-0.8%, mean 0.5%; Al₂O₃ 0.07-0.7%, mean 0.5%; CaO 0.04-0.7%, mean 0.2%; TiO₂, MnO, less than 0.1%). Plagioclase is almost pure albite (K₂O 0.6%, CaO less than 0.1%). One grain of forsteritic olivine was analyzed. The meteorite is an enstatite chondrite, and since part of the pyroxene is polysynthetically twinned clinoenstatite, it is classified as E4.

Sample No.: PCA82519

Location: Pecora Escarpment

Field No.: 2775

Weight (gms): 125.0

Meteorite Type: L5 Chondrite

Physical Description: Roberta Score

Dull brownish-black fusion crust covers 80% of this meteorite fragment. Oxidation is evenly disseminated throughout the interior surfaces. Unweathered matrix is dark gray and inclusion rich.

Dimensions: 4 x 6 x 3 cm

Petrographic Description: Brian Mason

A few chondrules are present, but their margins are diffuse, tending to merge with the granular groundmass, which consists largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite. A subspherical enclave, 3 mm across, is present; it consists largely of fine-grained spinifex-textured olivine. Brown limonitic staining is present throughout the section, but does not penetrate the enclave. Microprobe analyses give the following compositions: olivine, Fa24; pyroxene, Fs21. The composition of the olivine in the enclave is also Fa24. The meteorite is an L5 chondrite.

Sample No.: PCA82520
Field No.: 2769
Weight (gms): 22.7
Meteorite Type: H3 Chondrite

Location: Pecora Escarpment

Physical Description: Roberta Score

Overall shape of PCA82520 is pyramidal. Dull black fusion crust covers 80% of the stone while shiny reddish-brown fusion crust covers 20%. Extensive weathering has given the matrix a yellowish-to reddish-brown color. Some metal is still present.

Dimensions: 3 x 2 x 1.5 cm

Petrographic Description: Brian Mason

The section shows a close-packed aggregate of chondrules (up to 1.5 mm in diameter), chondrule fragments, and a few clasts, with interstitial nickel-iron and troilite and a relatively small amount of dark matrix. A considerable variety of chondrules is present, many of granular or porphyritic olivine with transparent to turbid interstitial glass; other types include fine-grained pyroxene, medium-grained olivine and polycrystalline twinned clinopyroxene, and barred olivine. Brown limonitic staining pervades the section. Microprobe analyses show olivine mainly in the range Fa15 to Fa22, but one clast has olivine Fa6; the mean composition is Fa17 (% mean deviation of FeO is 27). Pyroxene ranges in composition from Fs2 to Fs19, with a mean of Fs14 (% mean deviation of FeO is 24). The mean composition of the olivine and the amount of nickel-iron suggest H group, and the meteorite is tentatively classified as H3.

Sample No.: PCA82521
Field No.: 2731
Weight (gms): 1.4
Meteorite Type: H5 Chondrite

Location: Pecora Escarpment

Physical Description: Roberta Score

A little fusion crust remains on this extremely weathered stone.

Dimensions: 1 x 1 x 0.5 cm

Petrographic Description: Brian Mason

The section shows a few poorly defined chondrules in an unusually fine-grained matrix consisting largely of olivine and pyroxene with minor amounts of nickel-iron and troilite. The fine-grained matrix is dark gray in color from the presence of a dusting of fine inclusions, suggestive of shock. Small areas of red-brown limonite are present. Microprobe analyses give the following compositions: olivine, Fa18; pyroxene, Fs16. The meteorite is classified as an H5 chondrite.

Sample No.: PCA82522 Location: Pecora Escarpment
Field No.: 2709
Weight (gms): 45.5
Meteorite Type: H5 Chondrite

Physical Description: Roberta Score

Fusion crust covers 50% of PCA82522. Areas void of fusion crust are reddish-brown. The interior matrix is medium gray with numerous inclusions and oxidation halos. A discontinuous weathering rind was exposed.

Dimensions: 3.5 x 3.5 x 2 cm

Petrographic Description: Brian Mason

Chondrules are present, but are poorly defined and tend to merge with the granular groundmass, which consists largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite. The section has numerous narrow veinlets, partly replaced by limonite, which suggest a shock event. Considerable weathering is indicated by the limonite veinlets and brown limonitic staining throughout the section. Microprobe analyses give the following compositions: olivine, Fa18; pyroxene, Fs16. The meteorite is an H5 chondrite.

Sample No.: PCA82523 Location: Pecora Escarpment
Field No.: 2718
Weight (gms): 11.5
Meteorite Type: H6 Chondrite

Physical Description: Roberta Score

Brown to black fusion crust covers half of this meteorite fragment. Approximately a third of the exterior surface has been highly polished. The interior is relatively unweathered, light gray in color, and contains numerous veins.

Dimensions: 2.5 x 2.5 x 1 cm

Petrographic Description: Brian Mason

Chondritic structure is barely discernible, the section showing a granular aggregate consisting largely of olivine and pyroxene, with minor amounts of nickel-iron, troilite, and plagioclase. A minor degree of weathering is indicated by brown limonitic staining around metal grains. Microprobe analyses give the following compositions: olivine, Fa19; pyroxene, Fs16; plagioclase, An12. The meteorite is an H6 chondrite.

Sample No.: PCA82524
Field No.: 2766
Weight (gms): 113.8
Meteorite Type: H4 Chondrite

Location: Pecora Escarpment

Physical Description: Roberta Score

Black fusion crust covers most of this approximately square-shaped stone.

Chipping this sample exposed a continuous weathering rind, light gray colored matrix and numerous small light and dark colored inclusions. Oxidation is scattered throughout.

Dimensions: 5 x 4 x 3.5 cm

Petrographic Description: Brian Mason

Chondrules are abundant and well-developed, ranging up to 1.2 mm in diameter; a variety of types is present, including barred olivine, granular and porphyritic olivine and olivine-pyroxene, and fine-grained pyroxene. Some of the pyroxene is polysynthetically twinned clinobronzite. The groundmass consists largely of fine-grained olivine and pyroxene, with minor amounts of nickel-iron and troilite. A minor degree of weathering is indicated by brown limonitic staining around metal grains. Microprobe analyses give the following compositions: olivine, Fa18; pyroxene, Fs16. The meteorite is an H4 condrite.

Sample No.: PCA82525
Field No.: 2726
Weight (gms): 40.2
Meteorite Type: L6 Chondrite

Location: Pecora Escarpment

Physical Description: Roberta Score

PCA82525 has a shape similar to an arrowhead and is completely covered with fusion crust. Moderately weathered light gray material makes up the interior of this stone.

Dimensions: 4 x 3 x 1.5 cm

Petrographic Description: Brian Mason

Chondrules are sparse and poorly defined, their margins tending to merge with the granular groundmass, which consists largely of olivine and pyroxene, with minor amounts of plagioclase, nickel-iron, and troilite. Well-preserved fusion crust rims part of the section. A minor degree of weathering is indicated by brown limonitic staining around metal grains. Microprobe analyses give the following compositions: olivine, Fa24; pyroxene, Fs20; plagioclase, An10. The meteorite is an L6 chondrite.

Sample No.: PCA82526 & PCA82527 Location: Pecora Escarpment
Field No.: 2767 & 2795
Weight (gms): 24.9 & 3.4
Meteorite Type: H6 Chondrite

Physical Description: Roberta Score

Both of these specimens are completely covered with fusion crust. PCA82526 is more weathered than PCA82527. The less weathered portions of these stones are light in color with lighter and darker colored inclusions present.

Dimensions: 3 x 2.5 x 1 cm & 1.5 x 1 x 0.5 cm

Petrographic Description: Brian Mason

Chondrules are sparse and poorly defined, their margins merging with the granular groundmass, which consists largely of olivine and pyroxene, with minor amounts of nickel-iron, troilite, and plagioclase. A small degree of weathering is indicated by brown limonitic staining around metal grains. The section is rimmed by well-preserved fusion crust. Microprobe analyses give the following compositions: olivine, Fa18; pyroxene, Fs16; plagioclase, An12. The meteorite is an H6 chondrite.

PCA82527 is essentially identical to PCA82526 in texture, mineral compositions, and degree of weathering. The possibility of pairing should be considered.

Sample No.: PCA82528 Location: Pecora Escarpment
Field No.: 2737
Weight (gms): 51.4
Meteorite Type: L6 Chondrite

Physical Description: Roberta Score

Dull black fusion crust covers all surfaces of this meteorite including one fracture surface. What little material present that is not reddish-brown is dark gray-black in color. Abundant veins are apparent.

Dimensions: 4 x 3 x 2.5

Petrographic Description: Brian Mason

Chondrules are sparse and poorly defined, their margins merging with the granular groundmass, which consists largely of olivine and pyroxene, with minor amounts of plagioclase, nickel-iron, and troilite. Brown limonitic staining pervades the section. An unusually broad (up to 1 mm across) shock vein is present; it appears to consist largely of a pale gray, partly devitrified glass. Microprobe analyses give the following compositions: olivine, Fa25; pyroxene, Fs21; plagioclase, An10. The meteorite is an L6 chondrite.

Sample No.: TIL82406
Field No.: 2764
Weight (gms): 152.0
Meteorite Type: L4 Chondrite

Location: Thiel Mountains

Physical Description: Roberta Score

The overall shape of TIL82406 is angular with subrounded edges. Dull black fusion crust covers most of the stone. The dark gray interior contains numerous inclusions and oxidation is evenly scattered throughout.

Dimensions: 3.5 x 5.0 x 3.5 cm

Petrographic Description: Brian Mason

The section shows a close-packed aggregate of chondrules, up to 2 mm across, in a small amount of matrix consisting of fine-grained olivine and pyroxene and coarser grains of nickel-iron and troilite. The commonest types of chondrules are porphyritic olivine and olivine-pyroxene, and fine-grained pyroxene; much of the pyroxene is polysynthetically twinned clinobronzite. Brown limonitic staining pervades the section. Microprobe analyses give the following compositions: olivine, Fa23, pyroxene somewhat variable, mean Fs19. The meteorite is an L4 chondrite.

Sample No.: TIL82408
Field No.: 2752
Weight (gms): 80.0
Meteorite Type: LL3 Chondrite

Location: Thiel Mountains

Physical Description: Roberta Score

Polygonally fractured, black fusion crust coats much of the exterior of this stone. Areas void of fusion crust are somewhat friable. This meteorite is clast-rich with very dark gray to black colored matrix. Oxidation is evenly disseminated throughout the interior surfaces.

Dimensions: 4.5 x 4 x 2.5 cm

Petrographic Description: Brian Mason

The section shows a close-packed aggregate of chondrules and chondrule fragments, up to 4 mm across. The matrix is black and opaque, much of it forming rims to the chondrules; the matrix contains much sulfide and a little nickel-iron (largely weathered to limonite). A wide variety of chondrule types is present, including porphyritic and granular olivine and olivine-pyroxene, barred olivine, and fine-grained pyroxene. Many of the chondrules contain intergranular glass, sometimes clear and transparent, sometimes turbid and partly devitrified. Microprobe analyses show olivine and pyroxene, with variable compositions: olivine Fa1-Fa29, mean Fa15 (% mean deviation of FeO is 41); pyroxene, Fs2-Fs21, mean Fs9. The highly variable composition of olivine and pyroxene, and the texture, indicate type 3, and the small amount of nickel-iron suggests LL group, hence the meteorite is tentatively classified as an LL3 chondrite.

Sample No.: TIL82410
Field No.: 2734
Weight (gms): 18.8
Meteorite Type: Diogenite

Location: Thiel Mountains

Physical Description: Roberta Score

Dull blistery fusion crust completely covers one surface and appears as patches on the other surfaces. Areas void of fusion crust have a pinkish tinge. Single mineral clasts as large as 5 mm in longest dimension are abundant as are gray veins (1-5 mm wide) which show higher relief than the surrounding material. A single green crystal and several reddish-brown minerals are present.

Dimensions: 3 x 2.5 x 1.5 cm

Petrographic Description: Brian Mason

The section shows angular clasts of pyroxene, up to 3 mm in greatest dimension, in a groundmass of comminuted pyroxene. The only other minerals noted were rare grains of plagioclase and trace amounts (less than 1%) of nickel-iron. Remnants of fusion crust are present along one edge. The section is stained brown with limonite. Microprobe analyses show the pyroxene of uniform composition, Wo₂Fs₂₄En₇₄; it contains 0.47% Al₂O₃, 0.64% MnO, and 0.07% TiO₂. The meteorite is a diogenite.

Sample No.: TIL82412 & TIL82413
Field No.: 2772 & 2728
Weight (gms): 35.1 & 18.3
Meteorite Type: H5 Chondrite

Location: Thiel Mountains

Physical Description: Roberta Score

Both of these specimens are extensively weathered.

Dimensions: 3.5 x 3 x 2 cm & 3 x 2 x 1.5 cm

Petrographic Description: Brian Mason

Chondrules are fairly abundant, but their margins are poorly defined, tending to merge with the granular groundmass, which consists largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite. Brown limonitic staining pervades the section, and veinlets of red-brown limonite are present. Microprobe analyses give the following compositions: olivine, Fa₁₇; pyroxene, Fs₁₆. The meteorite is an H5 chondrite.

The sections of these meteorites are similar in all respects and the mineral compositions are the same. The possibility of pairing should be considered.

Sample No.: TIL82414 & TIL82415
Field No.: 2733 & 2794
Weight (gms): 14.2 & 70.2
Meteorite Type: H5 Chondrite

Location: Thiel Mountains

Physical Description: Roberta Score

Both TIL82414 and TIL82415 are covered with weathered fusion crust. The interiors have scattered patches of oxidation in a medium gray colored matrix with small light and dark inclusions.

Dimensions: 3 x 2 x 1 cm & 4 x 3 x 2.5 cm

Petrographic Description: Brian Mason

Chondritic structure is prominent, but individual chondrules are poorly defined and their margins tend to merge with the granular groundmass, which consists largely of olivine and pyroxene with minor amounts of nickel-iron and troilite. A minor degree of weathering is indicated by brown limonitic staining around metal grains. Microprobe analyses give the following compositions: olivine, Fa17; pyroxene, Fs15. The meteorite is an H5 chondrite.

The sections of these meteorites are very similar in texture and degree of weathering, and the mineral compositions are the same. The possibility of pairing should be considered.

Sample No.:	EET83230	Location: Elephant Moraine
Field No.:	1330	
Weight (gms):	530	
Meteorite Type:	Ataxite	

Physical Description: Roy S. Clarke, Jr.

This roughly equidimensional 5.5cm x 5.0cm x 3cm rounded individual is reminiscent of a small cobble. It is completely covered with a secondary reddish-brown coating of iron oxides, and no indication of fusion crust remains. The surface that has been recently exposed to wind ablation in our atmosphere is slightly smoother than the other surfaces, having rounded edges and a slightly distorted rectangular outline.

Tentative Classification: Roy S. Clarke, Jr.

A slice through one side of the specimen produced a 15cm^2 surface for examination. The matrix is martensitic, containing a few widely dispersed kamacite spindles. An occasional spindle will contain a very small schreibersite. The section's most interesting feature is a concentration in one half of the slice of about a dozen mm-sized iron phosphate crystals, some with euhedral outline and/or enclosed troilite. These inclusions are partially bordered by thin kamacites.

Sample No.:	EET83245	Location: Elephant Moraine
Field No.:	1323	
Weight (gms):	59.0	
Meteorite Type:	Coarsest Octahedrite	

Physical Description: Roy S. Clarke, Jr.

This specimen has a smoothly curved top surface that meets a flat bottom surface at one side and an irregular narrow surface that is perpendicular to the bottom surface on the opposite side. The rounded surface is 5.5 cm by 2.5 cm, and the side surface is 1.3 cm thick. The shield shaped specimen is completely covered with a reddish-brown coating of terrestrial iron oxides. No remnant fusion crust was visible. The curved surface appears to have been an exposed surface during weathering; wind ablated, polished, and slightly pitted. The other two surfaces are more deeply corroded.

Tentative Classification: Roy S. Clarke, Jr.

A slice from near one end of the specimen cut perpendicular to both the bottom and side surfaces yielded a 1.4 cm^2 metallographic section of mainly kamacite. The wind ablated surface was also an ablation surface during atmospheric passage, as it has a heat altered zone extending at least 1 mm into the interior. Fusion crust, however, has been removed by weathering on this surface. The bottom surface appears to consist of either weathered fusion crust or, more likely, weathered melt material that filled a crack during atmospheric heating. Some interior material along this bottom surface is also heat altered. Microrhabdites occur in abundance throughout, with occasional rhabdites and very thin lamellar schreibersites along subgrain boundaries. One grain boundary contains schreibersite and heat altered taenite. The presence of taenite in what appears to be a relatively large mass of kamacite suggests that this specimen is a fragment of a coarsest octahedrite.

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Sample No.:	ILD83500	Location: Inland Forts
Field No.:	2537	
Weight (gms):	2523	
Meteorite Type:	Ataxite	

Physical Description: Roy S. Clarke, Jr.

This specimen was found near Inland Forts by Bob Ackert of the University of Maine at Orono. It was found "imbedded in loose sandy till with abundant pebbles and cobbles of the Beacon Sandstone and dolorite. The glacial deposit overlies the Beacon Sandstone. The top of the white evaporite deposit marks the depth at which the iron was buried." The specimen is flat with an outline similar to a policeman's badge, 13.5 cm x 12 cm x 4 cm. It has three distinct surface types. The exposed surface as found is slightly irregular and covered with a scaly reddish-brown to dark reddish-brown iron oxide coating. This surface is bordered on the sides by a band of cream colored soil and clay a few mm's to a cm or slightly more thick. The sides and bottom of the specimen below this band have a much different appearance. The surface is rough, ranges in color from black to reddish-brown, and has numerous soil particles and sand grains adhering.

Tentative Classification: Roy S. Clarke, Jr.

A metallographic surface of 9 cm² was prepared for examination. The most prominent feature of the martensitic matrix surface are cm-long lamellar inclusions that appear to be oriented according to parent taenite crystallography. They are bordered by thin kamacite that occassionally contains schreibersite. They appear to have contained very thin cores that have been replaced by oxides due to weathering. The matrix contains a high concentration of schreibersites in the 50 micron range surrounded by kamacite. The orientation of the kamacite seems to have been controlled by schreibersite precipitation. One small troilite was seen. The specimen is similar in many ways to the meteorite Freda.